Human mesenchymal stem cells inhibit the differentiation and effector functions of monocytes

ABSTRACT

Although monocytes represent an essential part of the host defence system, their accumulation and prolonged stimulation could be detrimental and may aggravate chronic inflammatory diseases. The present study has explored the less-understood immunomodulatory effects of mesenchymal stem cells on monocyte functions. Isolated purified human monocytes were co-cultured with human umbilical cord-derived mesenchymal stem cells under appropriate culture conditions to assess monocytes' vital functions. Based on the surface marker analysis, mesenchymal stem cells halted monocyte differentiation into dendritic cells and macrophages and reduced their phagocytosis functions, which rendered an inability to stimulate T-cell proliferation. The present study confers that mesenchymal stem cells exerted potent immunosuppressive activity on monocyte functions such as differentiation, phagocytosis and Ag presentation; hence, they promise a potential therapeutic role in down-regulating the unwanted monocyte-mediated immune responses in the context of chronic inflammatory diseases.

Keyword: Mesenchymal stem cells; Monocytes; Phagocytosis; Antigen presentation; Immunosuppression